

applying magnetic field gradients to the imaging object;

applying RF energy to the imaging object according to a fast-spin echo technique;

and

subsequently applying RF energy to the imaging object according to a driven equilibrium technique.

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2. (Unchanged) The process of claim 1, further comprising:

detecting a nuclear magnetic resonance signal emitted by the imaging object; and

processing the nuclear magnetic resonance signal to provide imaging data.

3. (Unchanged) The process of claim 1, wherein the fast-spin echo technique includes application of a multi-echo NMR imaging sequence.

4. (Unchanged) The process of claim 3, wherein the multi-echo NMR imaging sequence includes a plurality of different echoes, and wherein each of the plurality of different echoes is encoded differently.

5. (Unchanged) The process of claim 3, wherein the multi-echo NMR imaging sequence includes a plurality of different echoes, and wherein at least one of the plurality of different echoes is encoded differently than another one of the plurality of different echoes.

6. (Unchanged) The process of claim 3, further comprising applying a 90-degree RF pulse at the center of any of the plurality of different echoes.

7. (Unchanged) The process of claim 6, wherein the applied 90-degree RF pulse has a phase such that magnetization of the imaging object is forced in the direction of the uniform polarizing magnetic field.

8. (Unchanged) The process of claim 3, wherein the multi-echo NMR imaging sequence includes a first 90-degree RF pulse followed by a series of 180-degree RF pulses.

9. (Unchanged) The process of claim 8, wherein the series of 180-degree RF pulses includes n 180-degree pulses, which are followed by n echoes.

10. (Unchanged) The process of claim 9, further comprising applying a second 90-degree RF pulse at a center of the n th echo, such that magnetization of the imaging object is oriented in the direction of the uniform polarizing magnetic field.

11. (Amended) An NMR imaging process, comprising:
subjecting the imaging object to a uniform polarizing magnetic field;
applying magnetic field gradients to the imaging object;
applying a first 90-degree RF excitation pulse;

applying a sequence of 180-degree RF excitation pulses following the first 90-degree RF excitation pulse; and

applying a second 90-degree RF excitation pulse following the sequence of 180-degree RF excitation pulses;

wherein each said 180-degree RF excitation pulse in the sequence generates a spin echo; and

wherein at least one said spin echo is encoded differently than another said spin echo.

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12. (Unchanged) The process of claim 11, further comprising:

detecting a nuclear magnetic resonance signal emitted by the imaging object; and
processing the nuclear magnetic resonance signal to provide imaging data.

13. (Canceled)

14. (Amended) The process of claim 11, wherein each said spin echo precedes a next 180-degree RF excitation pulse in the sequence.

15. (Amended) The process of claim 11, wherein the second 90-degree RF excitation pulse is applied at a center of the spin echo generated by a last 180-degree RF excitation pulse in the sequence.

16. (Amended) The process of claim 11, wherein each said spin echo is encoded differently.

17. (Canceled)

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18. (Unchanged) The process of claim 11, wherein the second 90-degree RF excitation pulse has a phase such that magnetization of the imaging object is forced in the direction of the uniform polarizing magnetic field.

19. (Unchanged) The process of claim 1, wherein the imaging object is a human being, and the uniform polarizing magnetic field is produced by a magnetic resonance imaging system, wherein the human being stands upright within the uniform polarizing magnetic field.

20. (Unchanged) The process of claim 2, wherein applying RF energy to the imaging object according to a fast-spin echo technique includes applying an RF pulse corresponding to the angular precession frequency for a selected plane of the imaging object.

21. (Unchanged) The process of claim 20, further comprising, after providing the imaging data, moving the imaging object and applying an RF pulse corresponding to the same angular precession frequency, to select a different plane of the imaging object.

22. (Unchanged) The process of claim 20, further comprising, after providing the imaging data, applying an RF pulse corresponding to a different angular precession frequency, to select a respective different plane of the imaging object, without moving the imaging object.

23. (Unchanged) The process of claim 11, wherein the imaging object is a human being, and the uniform polarizing magnetic field is produced by a magnetic resonance imaging system, wherein the human being stands upright within the uniform polarizing magnetic field.

24. (Unchanged) The process of claim 12, wherein the first 90-degree RF excitation pulse corresponds to the angular precession frequency for a selected plane of the imaging object.

25. (Unchanged) The process of claim 24, further comprising, after providing the imaging data, moving the imaging object and applying the first 90-degree RF excitation pulse corresponding to the same angular precession frequency, to select a different plane of the imaging object.

26. (Unchanged) The process of claim 24, further comprising, after providing the imaging data, applying the first 90-degree RF excitation pulse corresponding to a different angular precession frequency, to select a respective different plane of the imaging object, without moving the imaging object.

27. (New) The process of claim 16, wherein
each said spin echo is encoded by one or more of the magnetic field gradients;
and
the magnetic field gradient that encodes the spin echoes is stepped in amplitude to
encode each said spin echo differently.

But
28. (New) The process of claim 27, wherein the magnetic field gradient that
encodes the spin echoes is stepped in amplitude to generate data from each said spin echo
to fill respective different lines in k_x, k_y - space.

29. (New) The process of claim 28, wherein all the data generated from the spin
echoes fills the entire k_x, k_y - space so that an image of the imaging object can be
constructed from the data.

30. (New) The process of claim 29, wherein the k_x, k_y - space has dimensions of
 $n \times n$ data points, and there are n 180-degree RF excitation pulses in the sequence.

31. (New) The process of claim 28, wherein the different lines in k_x, k_y - space
are consecutive lines in k_x, k_y -space.
